

## THE DURATION OF THE GROWING SEASON FOR 1898.

The Editor has extracted from the annual summaries of the Climate and Crop Service some details as to the length of the growing season, so far as it is controlled by temperature, during the year 1898. The following table gives a summary of the dates of the last spring and the first autumn frosts; it gives only the approximate mean date for a State or section of a State. The actual dates at any station may have been ten or fifteen days earlier or later, but the total length of the season at any point in the State will scarcely vary ten days from that here given.

State.	Average date of frost.		Length of season.
	Last spring.	First autumn.	
			Days.
Georgia (southern) .....	March 15.....	October 26. ....	236
Georgia (northern) .....	April 7.....	October 25. ....	201
South Carolina (coast) .....	March 1.....	November 28.....	273
South Carolina (interior) .....	April 1.....	October 27.....	210
North Carolina .....	April 15.....	October 25.....	194
Maryland .....	April 15.....	October 30.....	199
Delaware .....	April 7.....	October 17.....	194
New Jersey.....	May 10.....	October 28.....	172
West Virginia.....	April 10.....	October 20.....	180
Texas (coast) .....	none .....	December 10.....	845
Texas (northern) .....	April 1.....	October 24.....	207
Mississippi .....	March 20.....	October 30.....	225
Arkansas .....	April 1.....	October 25.....	208
Oklahoma .....	April 7.....	October 20.....	197
Missouri .....	April 11.....	October 20.....	193
Wisconsin .....	May 1.....	September 20.....	143
Minnesota (southern) .....	May 5.....	September 15.....	134
Minnesota (northern) .....	May 20.....	September 9.....	113
South Dakota .....	May 1.....	September 21.....	144
California (northern coast) .....	January 28.....	November 20.....	297
California (middle) .....	February 23.....	December 1.....	262
California (southern) .....	March 28.....	November 15.....	232
California (special regions) .....	April 7.....	November 10.....	222
	May 6.....	November 10.....	168
	May 23.....	October 1.....	132

## RIBBON LIGHTNING.

The annual report for 1897 of the G. V. Juggarow Observatory Vizagapatam, India, contains some special remarks on the thunderstorms of that year. The sudden oscillations of pressure and temperature are shown by the self-recording instruments. On June 2 the record says:

A light shower fell, with a gust of wind from the north, and lasted for an hour. The peals of thunder were not very loud nor frequent. The flashes of sheet lightning were very frequent, but there were only a few flashes of forked lightning. One flash of forked lightning which appeared to the south was particularly vivid, having the appearance of a broad ribbon perpendicular to, and extending below, the horizon. The color of some flashes approached a light mauve, possibly due to the amount of dust in suspension in the atmosphere.

So far as we know, the ribbon feature of lightning has hitherto only been detected by means of photography. This seems to be the first case in which it was apparent to the naked eye.

## UNNECESSARY TORNADO ALARMS.

Under date of May 12, Mr. J. I. Widmeyer, section director for Oklahoma, says:

Long-range forecasters, through their ignorant predictions of tornadoes, are causing much unnecessary alarm to the inhabitants of Oklahoma. Not a single tornado has occurred this year, very few in other years, and the Weather Bureau has not as yet issued a single forecast "Conditions favorable for severe local storms;" but, in spite of this, every time a thunderstorm occurs, or a rain cloud appears in any part of the sky, accompanied by even moderate winds, every cave and cellar is filled with frightened men, women, and children. This undoubtedly causes more deaths as a result of exposure in these damp places than have been caused by all the tornadoes that ever occurred, while the constant fear and excitement have certainly a tendency to cause nervous troubles.

Of the three conditions necessary for the formation of tornadoes, two are distinctly local and can be ascertained by any one without the aid of a hygrometer or even a thermometer. Even should the two local conditions exist there need not necessarily be any cause for alarm, as the third condition which locates areas favorable for storms may be entirely absent. But when we have a temperature of about 70° in the early morning and a sultry humid atmosphere during the forenoon, surface winds fitful and changeable, and when clouds are observed moving in both a northerly and southerly direction, with erratic changes, the southwestern sky in such cases should be carefully scanned, for should danger be imminent it will come from that quarter. Tornadoes occur oftenest in the afternoon and evening, very rarely at night or forenoon.

It seems wise and necessary for the officials of the Weather Bureau to improve every occasion to allay the unnecessary alarm that pervades the community whenever one mentions the subject of tornadoes. Twenty years ago, when the Bureau began to collect and publish fairly correct statistics relative to these storms, the sum total of their number and the attendant destruction was so large as to be very impressive. The figures gathered by the meteorological reporters, purely for meteorological study with a view to the prediction of storms, were converted by sensational writers into a most alarming picture of the condition of the atmosphere in this country. Kansas, Iowa, and other portions of our fair land, became known as "tornado states." Many were frightened away from these States, and those who remained suffered unnecessary terror. Out of the natural desire to avoid a reputation for frequent tornadoes there grew a widespread determination to avoid the use of the word. Good citizens would allow that on very rare occasions they had an occasional "twister" or cyclone, a whirler or cloud-burst, a hailstorm or hurricane, but *never a tornado*. Newspapers shunned the word and insisted on using evasive terms.

In 1884 the Editor prepared for the proposed fourth edition of a little pamphlet entitled: "Weather Maps and How to Use Them," a table of relative frequency that clearly showed, not only the small chance of injury from tornadoes, but also that the chance was just as great in many small eastern States as in the large western States that had come especially under the ban of popular writers. One of the latter even went so far as to upbraid him with shirking his duty in that he did not join in the popular cry "beware of the western tornado."

There is really no more destruction done by tornadoes than by lightning, high winds, hailstorms, droughts, and floods, or other meteoric visitors. Fear and dread are inspired by the general knowledge that harm may occur, but fright and panic do not seize one until the dreaded apparition is at hand and visible. Fright is largely a matter of the nerves and the imagination; fear, of the intellect. Fright is not subject to reason, but fear may be so. By a careful, reasonable study of the maps of tornado tracks our observers will always be able to calm the minds of the citizens. It is unnecessary to resort to the caves and cellars, or to stop our ordinary avocations for fear of a tornado, until we see the cloud in the distance, or are positively certain that one is about to pass near us.

## THE CAMPHOR BAROMETER.

A recent number of the weekly bulletin of questions and answers, published by the Secretary of the French Association for the Advancement of Science, submits the following problem:

How can we explain the formation of clouds, threads, and crystals that are produced in the so-called chemical or camphor barometer, which consists of a solution in alcohol of equal parts, of three substances, the nitrate of potash, camphor, the hydrochlorate of ammonia, if the glass tube that contains this solution is hermetically sealed, and the varia-